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PATENT SPECIFICATION



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COMPLETE SPECIFICATION

**Method of and Means for Preparing a Web Roll for use in Web
Renewing Mechanism for Printing Machines**

We, R. HOE & Co. LIMITED, a company organised under the laws of Great Britain, of 109—112, Borough Road, London, S.E.1, do hereby declare the nature of this invention (which has been communicated to us by R. Hoe & Co. Inc., a corporation organised and existing under the laws of the State of New York, United States of America, of 138th Street & East River, City of New York, County of Bronx, State of New York, United States of America), and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the preparation of a replacement roll used in full speed roll changing mechanism for printing machines, the preparation being such as to enable the web of the replacement roll to be joined to the running web of an expiring web roll. The invention is more particularly concerned with the holding of the end of the web of the replacement roll against the body of the roll in such a manner that it will readily release itself at the time the join is made.

Before joining the web of a web replacement roll with the web of an expiring web roll, adhesive is applied to the leading end of the web of the replacement roll, upon its outer surface and the roll is then rotated up to the speed of the running web. The roll and running web are then moved relatively to each other, into contact, to cause the adhesive covered portion of the replacement roll to adhere to the running web of the expiring roll, which latter web is then severed and the new web is drawn into the printing machine.

Various means and mechanisms have been suggested and used for holding the free end of the web of the replacement roll closely thereto while it is being brought up to the speed of the running web and before it is joined thereto and for enabling the web of the replacement roll to free itself from the body of the roll when it adheres to the running web. All of these have contemplated the provision of means to cause a quick release of the aforesaid free web end at the moment the web join

is made, so as not unduly to strain the respective webs or cause interruption in the machine operation. Among these means, is the provision of so called gummed tabs for securing the free end of the web to the roll body by having a portion thereof adhering to both the free end and the body and tearing or otherwise separating, when the join is being made. Some forms of these tabs have been provided with weakened portions to facilitate the separation thereof, while others are arranged in such a manner as to readily rupture upon having a strain imposed thereon, such as occurs when lifting the free web end from the roll body. These tabs are of a particular form which require care in handling and in their proper application. The weakened form of tab has been found to be especially difficult to apply properly, without tearing it at the time of application and difficulty has been experienced due to their separating before the join is made and prematurely releasing the web.

The main object of the present invention is to avoid the necessity for employing weakened or specially shaped tabs (and to permit the use of tabs of no especial form or structure as for example a short piece of gummed strip from a roll of binding paper), while at the same time ensuring that the securing of the web end to the body of the roll will be such as to permit the web to be drawn off by the running web when engagement is effected between the two webs.

According to the present invention, a replacement roll having adhesive applied to it to enable the web of the roll to adhere to and to be drawn off by the running web has the leading end of the web secured to the body of the roll by one or more stickers at a point or points which are so spaced from the adhesive as to leave the zone or zones through which the web alone tears, leaving the stickers intact when adherence is effected and the web commences to be drawn off.

Preferred embodiments of the invention are illustrated in the accompanying drawings, wherein:

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Figure 1 is a diagrammatic view of a web feeding mechanism that provides for joining the web of a replacement web roll to the running web of an expiring web roll, and with which the invention may be employed.

Figures 2 to 8 inclusive are views of web replacement rolls, illustrating several forms and arrangements of web end securing means and of preparing the same for use in the carrying out of this invention;

Figure 2 shows web end securing means disposed at the points or apices of the salient angles of a fish-tail form of web end;

Figure 3 shows web end securing means applied to a roll having its web end formed with a straight leading edge from which a tapered portion has been cut at each end and also at the centre;

Figure 4 shows an arrangement similar to that shown in figure 2, except that the points of the fish-tail are disposed adjacent the ends of the roll and the web securing means is of somewhat different form;

Figure 5 shows a web end securing means disposed at the point or apex of a salient angle form of web end;

Figure 6 shows a form of releasable web end securing means somewhat similar to that shown in figure 4, but with an additional feature provided which will be hereinafter pointed out;

Figures 7 and 8 illustrate further modifications of the invention.

A typical non-stop web roll changing mechanism is illustrated in figure 1 and comprises a roll supporting reel 11 rotatably mounted upon a support 12 and adapted by means of arms 13, 14 and 15 to rotatably support web rolls and to be actuated to move them into and out of web feeding position. An expiring web roll 16 is shown supported by arm 13 with its web 17 running to a printing machine (not shown), the reel 11 having been rotated to move the expiring roll 16 into the position shown, from the position at present occupied by the replacement roll 18 which is shown in web joining position with respect to the web 17.

A roll rotating device including a driven belt 19, is provided, to rotate the roll 18 and bring it up to the speed of the running web 17 before the join between the respective webs is made. A swingable web engaging brush 21 is provided to press the running web 17 against the roll 18 to cause it to be joined to the web end 22 thereof by adhesive previously disposed thereupon, and a web severing knife 23 is provided to sever the running web 17 as soon as the join is made. It will be understood that suitable mechanism is provided to operate the roll rotating belt 19, the brush 21 and the knife 23 in properly timed sequence so that no interruption in the

operation of the machine will be caused.

As referred to above, adhesive is disposed between the web 17 and the web end 22 of the replacement roll previous to making the join, and this is indicated herein as being applied upon the web end 22 in the form of a narrow strip 24. The strip of adhesive 24 follows the contour of the form of the web end, being disposed close to the edge thereof, a space being left where no adhesive is applied, as indicated at 25 to permit contact of the belt 19 therewith without it adhering thereto.

As shown in figures 2, 4 and 6, the web end 22 is in the form of a fish-tail, the points or apices 26 of the salient angles 27 thereof, being disposed in figure 2, spaced inward from the ends of the roll 18. In figures 4 and 6, the apices 26 and the side edges of the web end are adjacent the ends of the roll 18. A slip or sticker 28, comprising a short strip of gummed material is shown in figure 2 pasted to both the web end, at the apices 26 and the next course of web material on the roll 18, in such a position that one of its straight side edges 29 extends over the edge of the web end 22 forming an acute angle therewith and being substantially parallel to the adjacent side edge of the web end. In figure 6, a disc-like sticker 31 is provided, while in figure 4, a short piece of strip material 32 is used as a sticker to secure the leading or front end of the web to the next course thereof on the roll 18.

The stickers are slightly spaced from the adhesive strip 24 so as to provide a strip of web material therebetween, not covered by either adhesive or any portion of the sticker. Preferably, the strip of adhesive 24 starts at a point in close proximity with the edge of the web and adjacent its intersection with the sticker and extends angularly across the web, toward the adjacent end of the roll 18. The purpose of the above arrangement is to ensure that the separation or parting of the web will take place between the sticker and the strip of adhesive leaving the sticker intact and be directed toward the adjacent end of the roll, substantially instantaneously, to separate the web end 22 from the roll when the web end is joined to the running web 17 and to require that the web be parted along only a comparatively short line. The small arrows shown on the drawings adjacent the leading edge of the web end indicate the general direction in which it is torn when separated from the holding means.

In figure 6, a reinforcing piece of gummed strip material 33 is secured to the underside of the web end 22, to direct the tear of the web material and more positively guide it toward the adjacent roll end. In

the other forms, the natural tendency of the tear to extend toward the roll end is assisted by the reinforcement accorded this portion, by the join between the same and the running web, due to the disposition of the adhesive at an angle extending backward around the roll and toward the adjacent edge thereof. A short piece of strip material 34 may be secured to the centrally disposed apex of the angle of the fish-tail form of web end, to prevent possible fracture of the web at this point during the joining operation.

In figure 3 the web end 22 is shown cut or torn to form two leading edges 30, the shape being somewhat similar to that which would be obtained by removing the pointed portions of the fish-tail arrangement of figure 2, and the centre portion is shown rounded, as some operators prefer to tear it in that manner. With this form of web end, a sticker 32 is used at each corner, and the adhesive strip 24 applied preferably as shown, so as to leave a portion of the web uncovered beside and behind each sticker. It will be observed that when proportioned as shown, the web end has four side edges to each of which a tear is directed (as indicated by the adjacent small arrows) when the web end is being separated from the roll. In this instance the belt path 25 is shown in the centre.

Figure 5 illustrates a web end 22 formed as a salient angle with a sticker 35 connecting the web end 22 to the roll 18 at the apex of the salient angle. The strip of adhesive 36 in this instance, is applied in the form of a V-shape, with the sticker 35 disposed between the arms thereof, and extends from one side of the angle to the other. Reinforcing strips 37 are provided disposed beneath the web and aligned with the strip of adhesive 36 to ensure parting of the web between the sticker 35 and the adhesive 36, the lines of tear in this instance converge as indicated by the small arrows on the drawing.

Referring to the modifications of figures 7 and 8, these show a roll in which further to ensure that the web end will part in the region between the strip of adhesive and the zone at which the end is secured by a sticker to the body of the roll, the web itself is weakened by perforation. For example, in figure 7 in the preparation of the web end 22 for its connection with the running web 17 it is given the form of a single salient angle, as at 46 or is formed with additional salient angles as at 47 in figure 8, the strip of adhesive 24 in both forms follows the form given the web end and spaced slightly from the edge thereof.

In figure 7 the web end 22, at the apex 49, is joined to the next course of the web

by a gummed tab 51, secured to both and overlapping the edge of the apex and directly following the point of connection of the gummed tab 51, the web end 22 is perforated as at 53. The perforation is extended across the apex 49 in each instance sufficiently to leave only a determined amount of web material between each end of the perforation and the sides of the salient angle.

In the form shown in figure 7 the strip of adhesive 24, extends along the side of the salient angle from spaced apart points adjacent the perforations to each edge of the web at the roll ends. The combined width of the web material between the ends of the perforation and the adjacent edge of the salient angle is preferably less than the width of web material disposed between the spaced apart ends of the strip of adhesive 24, at the apex 49. This arrangement ensures that the web weakening effect of the perforation will cause the web to part between the perforation and the angle sides, rather than at another point, when the web end 22 is pulled away from the roll 18 by the running web 17 after adhering thereto, as above described. The perforation 53 is shown triangular in form with one side thereof disposed intermediate the sides of the salient angle and substantially parallel to the roll axis, the point of the triangular shape of the perforation 53, opposite the aforesaid side thereof being disposed between the ends of the adhesive strip 24 to reduce the width of the web material therebetween.

In figure 8 the web end 22 is secured to the next course of the web on the roll 18 by a gummed tab 56 disposed across the apices of each angle 47. The web material at this point is weakened, in comparison with adjacent portions thereof, by the provision of the perforations as by mutilation of the web material along a line as shown in dotted lines at 57.

By the provision of perforations or weakening shown in figures 7 and 8 the normal strength of the web material is weakened between the point of attachment of the web to the roll, and the portion of the web directly following the point of adherence of the web end to the web 17 of the web expiring roll, whereby a quick parting of the web material will take place when the web join is made without tearing the stickers 51 or 56. At such moment, the web portion at the apex of the salient angle will part from the web end, by quickly tearing from the same, substantially along a line extending between the sides of the salient angles 46 or 47.

In the form of web end shown in figure 8 a reinforcing strip 48 may be pasted or otherwise secured, at the corner formed,

intermediate the sides of the web, by the meeting of the inner sides of each of the angles 47. The outer sides of each of the angles 47 extend until they run off the adjacent sides of the web at the ends of the roll 18.

It will be apparent that the method of preparing a roll end as herein described obviates the use of specially formed or weakened tabs or the like, while firmly holding the web end and permitting its quick release from a roll, without causing undue strain to be imposed upon the web, premature parting thereof, or interference in the continuous operation of the machine.

It is believed to be obvious that a reinforcing strip may be secured beneath the web ends 22 in the forms shown in figures 2 and 4 in a manner similar to the arrangement shown in figure 6.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. For use in web renewing mechanism, a replacement roll having adhesive applied to it to enable the web of the roll to adhere to and to be drawn off by the running web and in which the leading end of the said web is secured to the body of the roll by one or more stickers at a point or points which are so spaced from the adhesive as to leave a zone or zones through which the web alone tears leaving the stickers intact when adherence is effected and the web commences to be drawn off.

2. A roll as claimed in claim 1 and in which the web end is shaped to provide one or more salient angles at the apex region of which or each of which a sticker is applied, the adhesive material being applied along the side edges of the or each salient and being clear of the sticker to provide the zone or zones through which the web tears.

3. A roll as claimed in claim 1 or 2 and in which the adhesive and the sticker or

stickers are so disposed that the line of tear through the zone or zones extends diagonally to the roll.

4. A roll as claimed in claim 2 or 3 and in which a single salient is formed by shaping the end of the web backwardly from a substantially central apex or salient at which a sticker is applied, leaving a zone between the sticker and the adhesive.

5. A roll as claimed in claim 2 or 3 and in which two salient angles are provided by shaping the end of the web to a fish tail shape, having two salient angles or apices spaced apart across the width of the roll, a sticker so being provided at each apex as to leave a zone between each sticker and the adhesive.

6. A roll as claimed in any of the preceding claims and having one or more reinforcing strips applied to the web end to reinforce the said end in the region of the adhesive and to assist in directing the tear through the zone or zones between the adhesive and the sticker or stickers.

7. A roll as claimed in any of the preceding claims and in which the web end is weakened by perforation at the one or more zones between the sticker or stickers and the adhesive on the web end.

8. The method of preparing a replacement roll for use in web renewing mechanism which consists in so applying adhesive to the outer surface of the leading end of the web of the replacement roll and so securing the said leading end to the body of the roll by one or more stickers as to leave one or more tearing zones of web material between the sticker (or stickers) and the adhesive.

9. A web roll prepared substantially as described with reference to the accompanying drawings.

Dated the 16th day of September, 1936.
CARPMAELS & RANSFORD,
Agents for Applicants,
24, Southampton Buildings, London,
W.C.2.

[This Drawing is a reproduction of the Original on a reduced scale.]

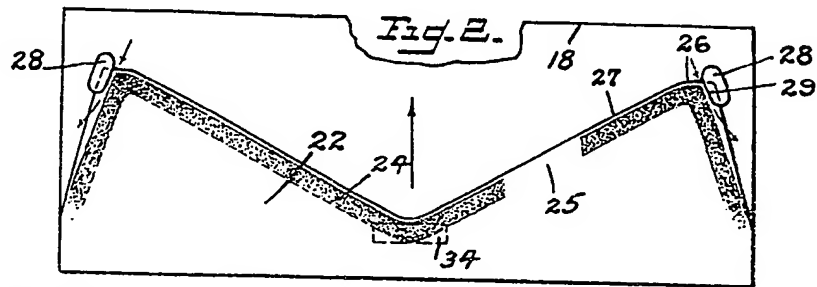


Fig. 3.

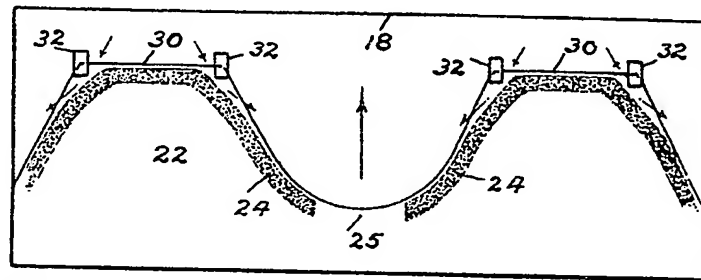


Fig. 4.

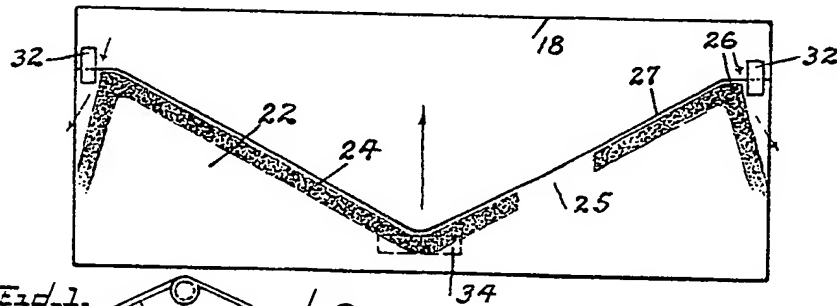


Fig. 1.

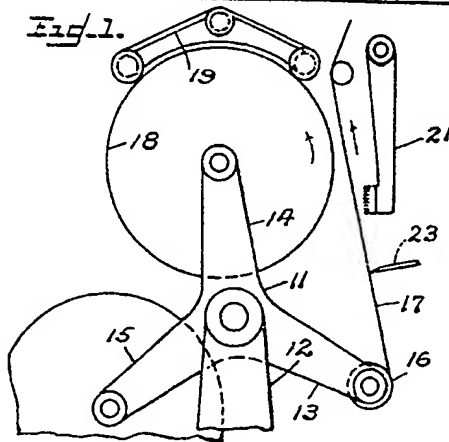


Fig. 5.

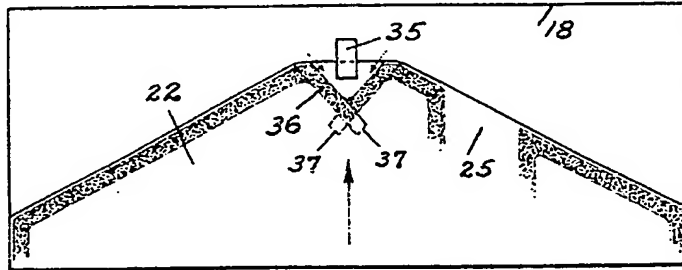


Fig. 6.

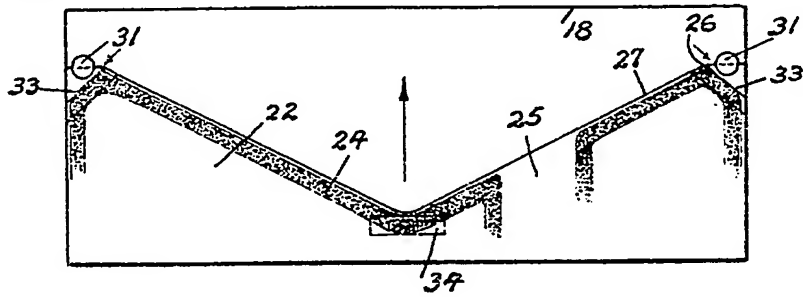


Fig. 7.

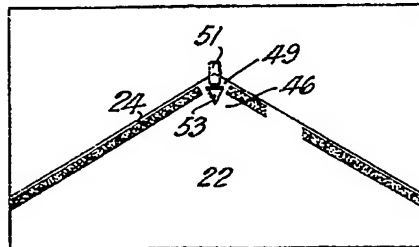
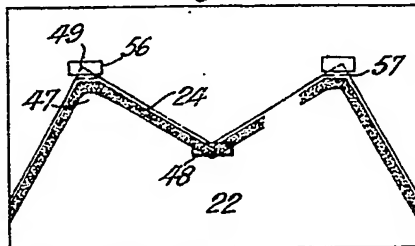


Fig. 8.



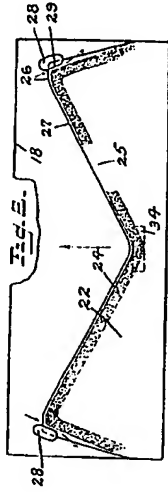


Fig. 1.

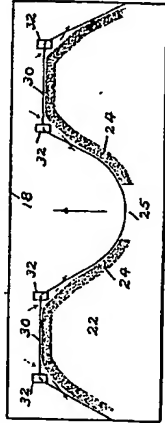


Fig. 2.

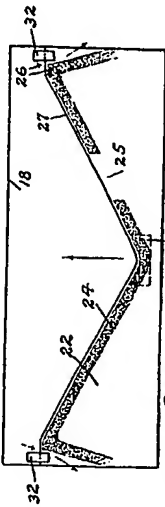


Fig. 3.

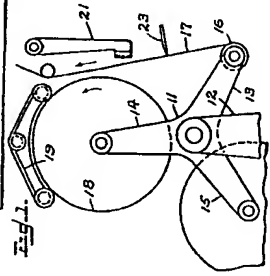


Fig. 4.

Fig. 5.

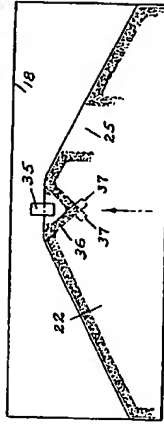


Fig. 6.

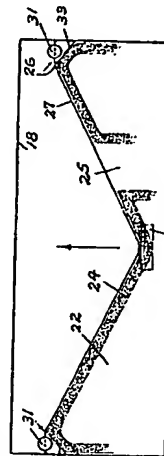
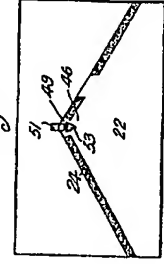


Fig. 7.

Fig. 8.



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